REMARKS

Claims 1-20 have been resubmitted. Claims 1, 2, 11, and 13-15 have been amended. Claims 5-10 have been canceled. New Claims 21-45 have been added.

The Examiner objected to Claims 9, 13, and 15 for informalities. The Examiner rejected Claims 2, 3, 7, and 10 under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter that the applicant regards as the invention.

Additionally, the Examiner rejected Claims 1, 2, and 4 under 35 U.S.C. § 102(a), as being anticipated by Li et al. (U.S. Patent Number 6,159,553). The Examiner also rejected Claims 1, 2, 4, 5, 8, and 11 under 35 U.S.C. § 102(b), as being anticipated by Cook (U.S. Patent Number 3,942,293). The Examiner rejected Claims 1-7, 11, 12, 15-17, and 20 under 35 U.S.C. § 102(b) as being anticipated by Iwamoto et al. (U.S. Patent Number 4,976,806). The Examiner also rejected Claims 1, 2, 5, 6, and 7 under 35 U.S.C. § 102(b) as being anticipated by Matsudaira (U.S. Patent Number 4,670,355). The Examiner further rejected Claims 1 and 2 under 35 U.S.C. § 103(a) as being unpatentable over Iwamoto.

The Examiner indicated that Claims 9, 13, 14, and 18 would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The Examiner also indicated that Claim 10 would be allowable if rewritten to overcome the rejection under 35 U.S.C. § 112, second paragraph, and to include all of the limitations of the base claim and any intervening claims.

Examiner Interview

Examiner and Applicant conducted a telephone conference on March 28, 2003. The Examiner and Applicant discussed the prior art and suggested appropriate amendments towards allowable claims. No agreement was reached.

Informalities

Applicant has amended the claims to address informalities mentioned by the Examiner.

35 U.S.C. § 112, second paragraph

Applicant has amended Claims 2 and 3 to address issues mentioned by the Examiner. Applicant has cancelled Claims 5-10, thus mooting the § 112 rejections for Claims 7 and 10.

Li et al. (US 6,159,553)

The Li reference discloses a silicon nitride substrate with a silicon nitride coating. The coating comprises zirconium oxide, tantalum oxide, and mullite (col. 1, lines 50-67).

However, the Li reference does not disclose the presence of Al_2O_3 as an additive, as disclosed in Claim 1, as amended. Thus, Applicant submits that Claim 1, as amended, and Claims 2 and 4, dependent upon Claim 1, are not anticipated by Li et al.

Cook (US 3,942,293)

The Cook reference discloses a metal oxide coating for use as a mortar or grout for bricks lining reaction vessels. (col. 2, lines 9-15; col. 4, lines 31-33). The Cook coating is not suitable for "working surfaces" adjacent to fluid flow. (col. 1, lines 12-14, 45-55; col. 4, lines 23-33; and col. 5, lines 7-10).

The present invention functions to protect surfaces adjacent to fluid flow, such as in a turbine engine environment. Also, the Cook reference contains no examples of using Ta_2O_5 mixed with Al_2O_3, as in the present invention. Furthermore, the Cook reference does not suggest or mention that the Al_2O_3 concentration should be as low as 11 mol%, as disclosed in Claim 1, as amended. Thus, Applicant submits that independent Claim 1, along with its dependent Claims 2 and 4 are not anticipated by the Cook reference. Claim 8 has been cancelled, thus Applicant submits that the rejection of Claim 8 is moot.

Further, Cook makes no mention of eliminating CaO as an ingredient, which is disclosed in Claim 11. Thus, Applicant further submits that Claim 11 is patentable over the Cook reference.

Iwamoto et al. (US 4,976,806)

The Iwamoto reference discloses a bonding composition for bonding ceramics to metal or ceramics to other ceramics. (col. 1, lines 7-14 and col. 5, lines 36-40). The Iwamoto bonding composition requires CaO as an ingredient. (col. 3, lines 4-8, and col. 10, lines 21-24, 32-34).

In contrast, using CaO in the present invention would harm the coating property of Ta_2O_5 by enhancing the transformation of Ta_2O_5 and increasing the grain growth of Ta_2O_5, which is contrary to the goals of the present invention, as

described in Paragraph [0004] at lines 6-9 of the specification as originally filed. Using CaO in the present invention would cause the coating to not operate as needed. This is an unexpected result not anticipated by the prior art, including the Iwamoto reference.

Additionally, Claim 11 refers to the present invention comprising "a protective coating of crystalline composition on an outer surface." Iwamoto contains no reference or suggestion of a protective coating; rather it bonds ceramics to metal or ceramics to other ceramics. (col. 1, lines 7-14 and col. 5, lines 36-40). Iwamoto also makes no reference to an "outer surface" or a "crystalline composition", as in the present invention.

Regarding Claim 12, Iwamoto makes no mention of the range "1-50 mol%". Iwamoto also make no mention of using "carbides" which are relevant to Claims 4, 11-20 and new Claims 24, 25, 29, 32, 33, 35, 38, and 43.

Regarding Claim 15, the Examiner referenced Example 3 in Iwamoto as disclosing the mixing and heating of oxides and applying them to a substrate. Applicant notes, however, that Iwamoto's Example 3 does not mention the use of Ta_2O_5.

As CaO is explicitly eliminated in independent Claims 1, 11, and 15, as amended, the Iwamoto reference does not anticipate these claims or their dependent claims, as Iwamoto requires an element that these claims exclude.

Matsudaira (US 4,670,355)

The Matsudaira reference discloses an electroluminescent display panel with a transparent glass substrate and a layer including Ta_2O_5 and Al_2O_3. (col.

2, lines 21-26, 51-54). The dielectric layer should be in intimate contact with an adjacent layer. (col. 1, lines 36-38).

Claim 1, as amended, comprises a "protective coating." The Matsudaira disclosure does not teach a protective coating. Instead, it teaches a coating for an electroluminescent flat panel display. Additionally, the Matsudaira reference does not disclose, "the aluminum oxide (Al_2O_3) concentration is as low as 11 mol%; and wherein a presence of CaO is eliminated" as disclosed in Claim 1, as amended. Thus, Applicant submits that independent Claim 1, as amended, along with its dependent Claim 2, are not anticipated by the Matsudaira reference. Applicant further submits that the rejection of Claims 5, 6, and 7, being cancelled, is now moot.

Haluska (US 4,973,806)

As in Matsudaira, above, the Haluska reference relates to an electroluminescent display. (col. 1, lines 5-10).

Also, as in Matsudaira, the Haluska reference does not anticipate Claims 1 and 2, as amended. Specifically, independent Claim 1, as amended discloses the use of aluminum oxide in a concentration as low as 11 mol% and the elimination of CaO. These elements, among others, are not disclosed, mentioned, or suggested in the Haluska reference. Thus, Applicant submits that independent Claim 1, and its dependent Claim 2 are patentable over the Haluska reference.

New Claims

New Claim 21 finds support in the originally filed Application at page 5, paragraph [0017], lines 7-8 ("Additional additives (e.g., nitrides, carbides,

borides, silicides) can be introduced . . .") and in the originally submitted Claim 3 New Claim 21 is dependent upon independent Claim 1, which contains Al_2O_3 in a concentration as low as 11 mol% and with CaO eliminated. The prior art does not contain these elements, among others.

New Claim 22 is original claim 9, re-presented as an independent claim, as suggested by the Examiner. New Claims 23-28, are dependent upon new Claim 22 and find support in originally filed claims 2-7. Additionally, new Claim 29 is original Claim 13, re-presented as an independent claim, as suggested by the Examiner. New Claims 30 and 31 are dependent upon new Claim 29 and find support in originally filed claims 12 and 14. Likewise, new Claims 32-34 are original Claims 14, 18, and 10, respectively, re-presented as suggested by the Examiner.

New Claim 35 finds support in Example 2, in paragraph [0022] on page 7 of the originally filed specification. Applicant submits that new Claim 35 is allowable over the prior art, as the Examiner has indicated that: "The prior art of record does not teach or give motivation to form the specific combination of tantalum pentoxide with lanthanum oxide, where lanthanum oxide is present in the range of 1-10 mol%, applied as a coating on a silicon-based substrate." (Office Action, page 6, lines 16-18).

New independent Claim 36 and its new dependent Claims 37-40 find support in Example 1, in paragraph [0021] on page 6 of the originally filed specification. Applicant submits that these claims are allowable as the prior art does not teach or render obvious the subject matter of Claims 36-40.

Likewise, new independent Claim 41 and its new dependent Claims 42-45 find support in Example 2, in paragraph [0022] on page 7 of the originally

filed specification. Applicant submits that these claims are allowable as the prior art does not teach or render obvious the subject matter of Claims 41-45.

CONCLUSION

Reconsideration and withdrawal of the Office Action with respect to Claims 1-20 is requested. Applicant requests allowance of new Claims 21-45.

In the event the examiner wishes to discuss any aspect of this response, please contact the attorney at the telephone number identified below.

Respectfully submitted,

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